Achieving Chemical Use Reduction and Waste Minimization through the Chemical Supply Chain

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Servicizing: beyond product-in-a-box

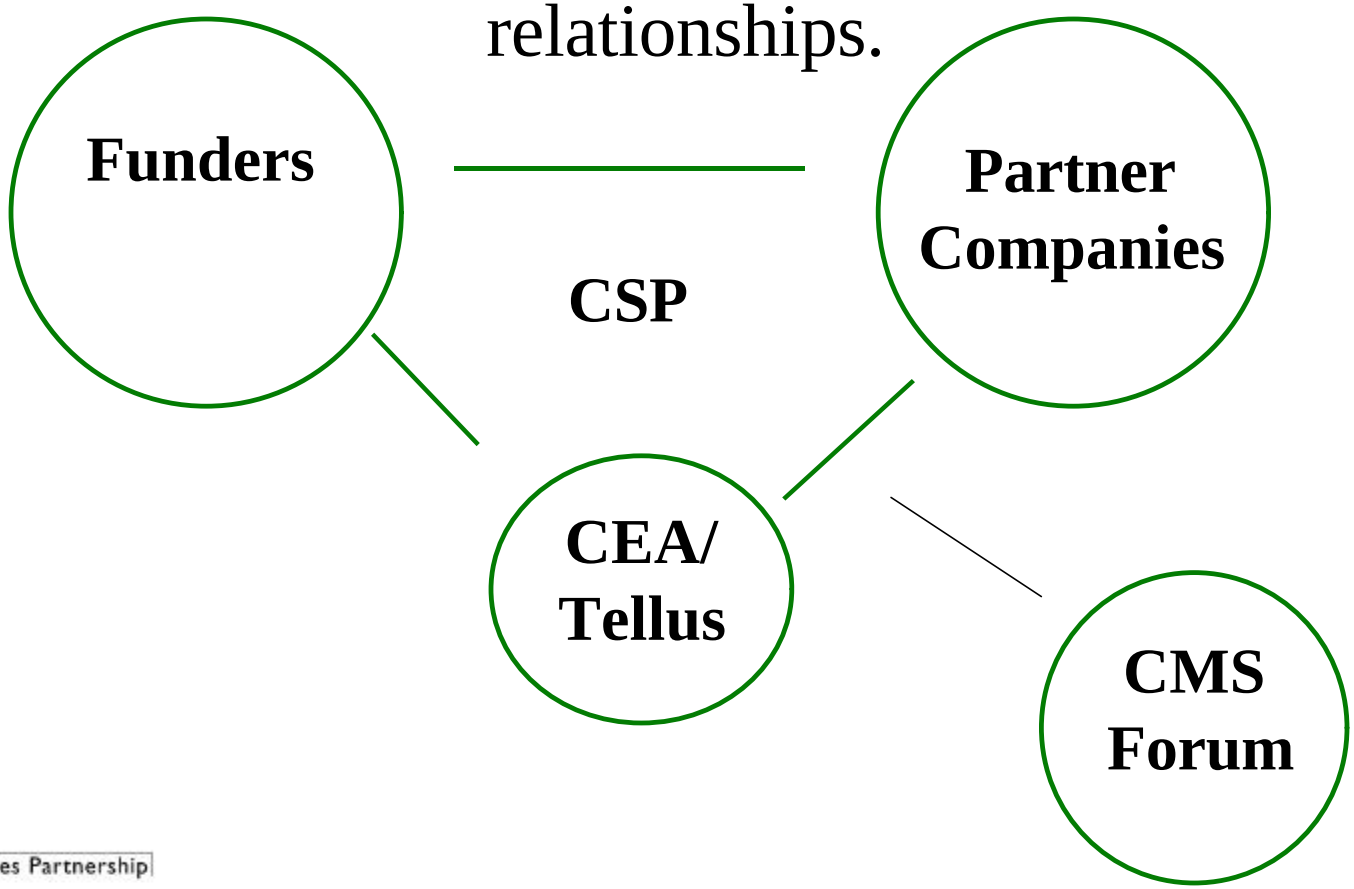
- "Servicizing"
  - The emergence of a class of product-based services; manufacturers who traditionally delivered "products in a box" are increasingly viewing products as a vehicle or platform to deliver service or function.

company	product	service
Castrol Industrial North America	Metalworking fluids (lubricants)	Chemical management services – may manage procurement, delivery, inventory, storage, labeling disposal. Performance-based compensation
Xerox	Document Services	Integrated document storage and reproduction with business systems to achieve just in time, customized document production
Coro (Herman Miller)	Post-occupancy services	Move, churn and inventory management for staff and office relocation (large commercial firms)

  - Cornerstone: change in compensation for the supplier from volume of product supplied to quality/quantity of services provided

Chemical Strategies Partnership

Primary goal is to promote chemical use reduction in manufacturing through strategic chemical service relationships.



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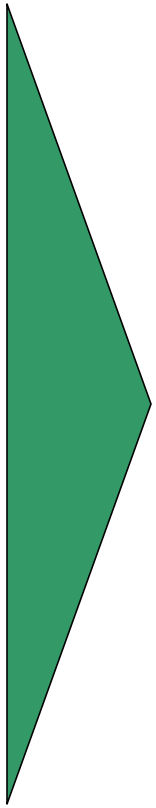
CMS - A Different Way of Doing Business

FROM…..

Traditional

- Focus on material cost
- Volume-based chemical cost
- Volume-based discounts
- User-driven chemical management
- Arms-length negotiation
- Opposed financial incentives
- Fragmented approach



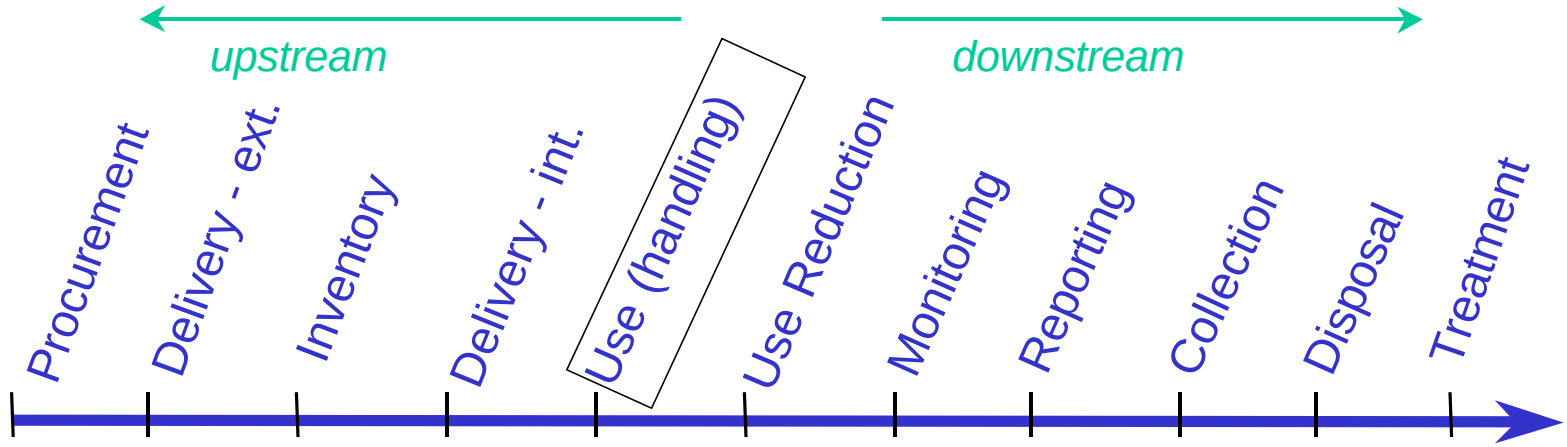
TO …..

CMS

- Focus on lifecycle cost
- Unit pricing
- Gain Sharing
- Supplier-driven chemical management
- Partnership
- Aligned financial incentives
- Systems approach

The Case of Chemical Management Services (CMS)

- The chemical lifecycle (the user's perspective)

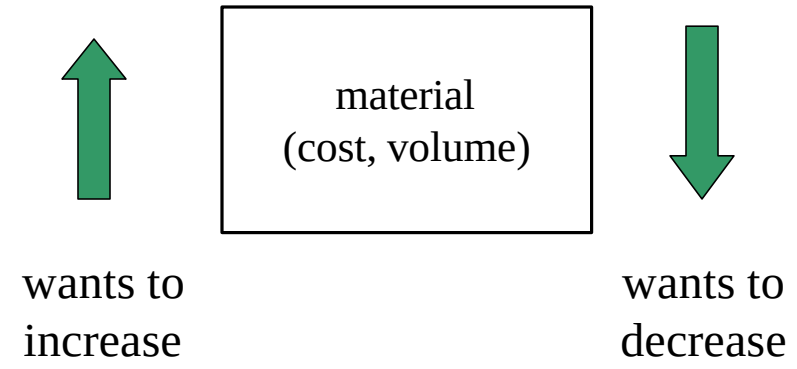


  - At every stage, opportunities for use, risk and cost reduction ***if*** the right incentives are in place.

Aligning Incentives

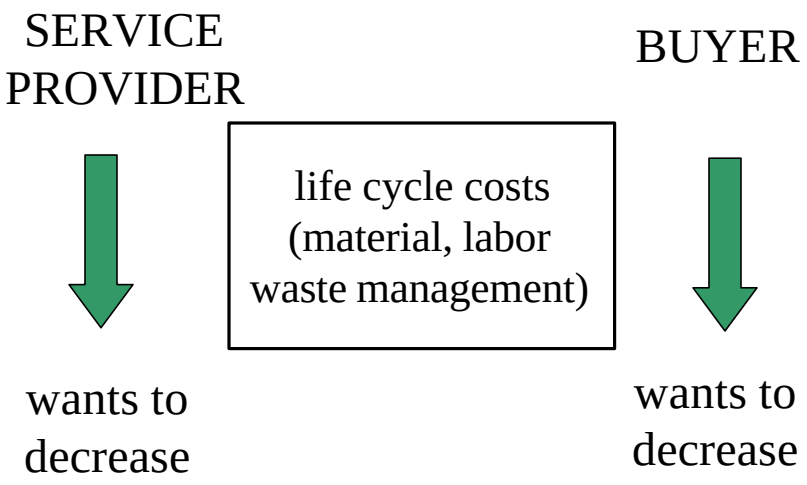
Traditional Relationship

Conflicting Incentives



CMS Model

Aligned Incentives



Change in the supplier compensation model: the source of potential environmental gains

CMS in the field

- Does the model work? Collaborations in the field
  - General Motors, Raytheon, Nortel, AMP
  - Seagate Technologies, Analog Data Systems, Stanford Linear Accelerator Center
  - Coalition of small metal working firms

Benefits from Service Contracts:

GM: Program in over 90% of plants worldwide

- Total chemical use reduction averages 30 %
- Total cost savings are well above 30 %
- Environmental Benefits:
  - Reduction in the number of chemicals
  - Reduction in the amount of chemicals used (purge solvent)
  - Elimination of chemicals
  - Reduction in the complexity of chemicals used

Benefits from Service Contracts:

In first 3 years at a Semiconductor facility

⇩ on-site chemical inventory by 50%

⇩ 50% of annual chemical consumption in 2 yrs.

⇩ 8% of hazardous wastes in 2 yrs. resulting in savings of $24,000/yr.

- Substituted several chemicals resulting in savings of $120,000/yr.
- Changed container size of chemicals resulting in savings of $55,000/yr.

Benefits from Service Contracts:
Aerospace electronics facility

Results from the first year of a service contract:

- Savings of $1.1 million (on $1.5M of chems. purchased)

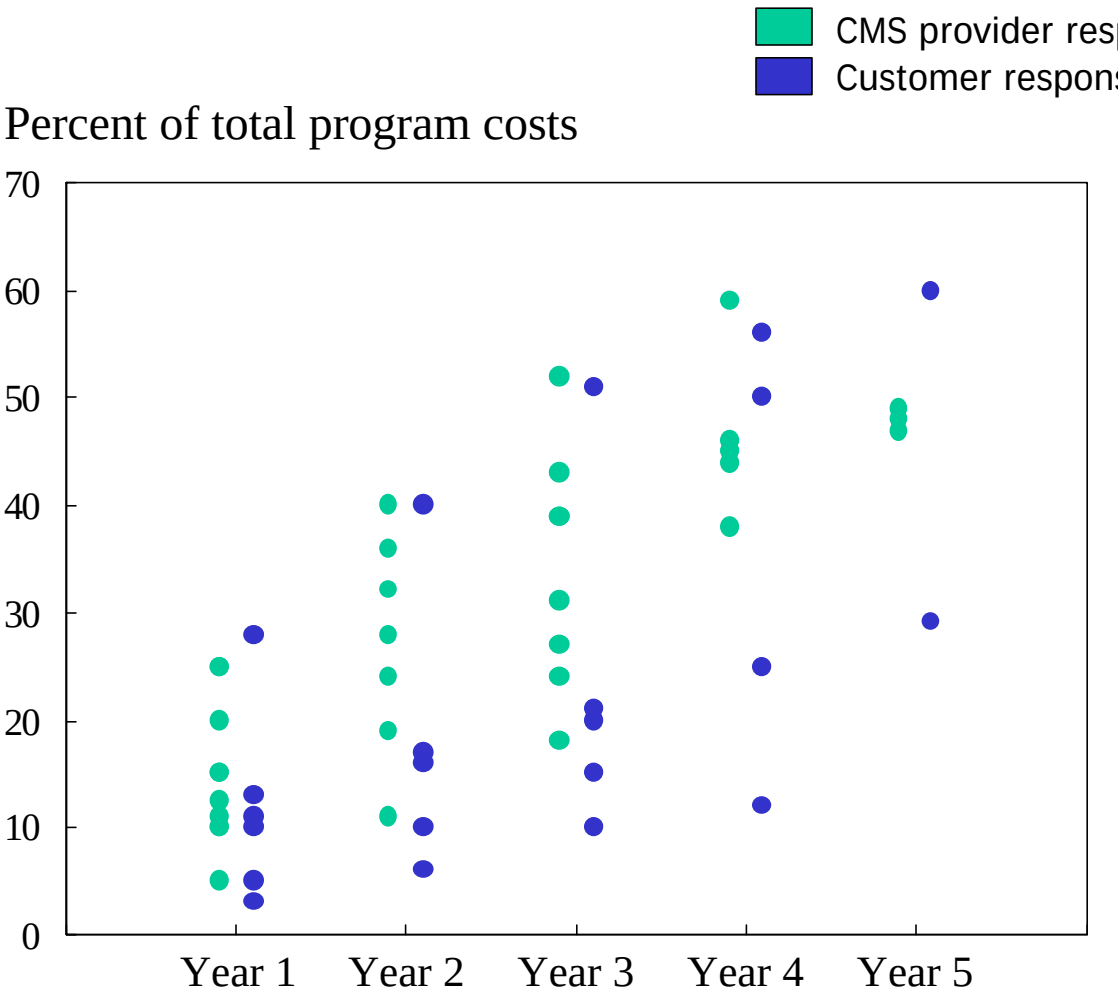
⇩ Costs by 15-20% due to chemical purchasing consolidation

⇩ Procurement and chemical mgmt. costs by 50%

⇩ Procurement cycle time from 15 days to less than 1 day

⇩ Hazardous waste generation by 75%

The overall cost savings reported by CMS customers are significant



Total net savings
Dollars

Key results

- 5-25% savings in the first year
- 30-80% of long-term savings come from reducing management costs
- 80% of customers reported chemical volume reduced

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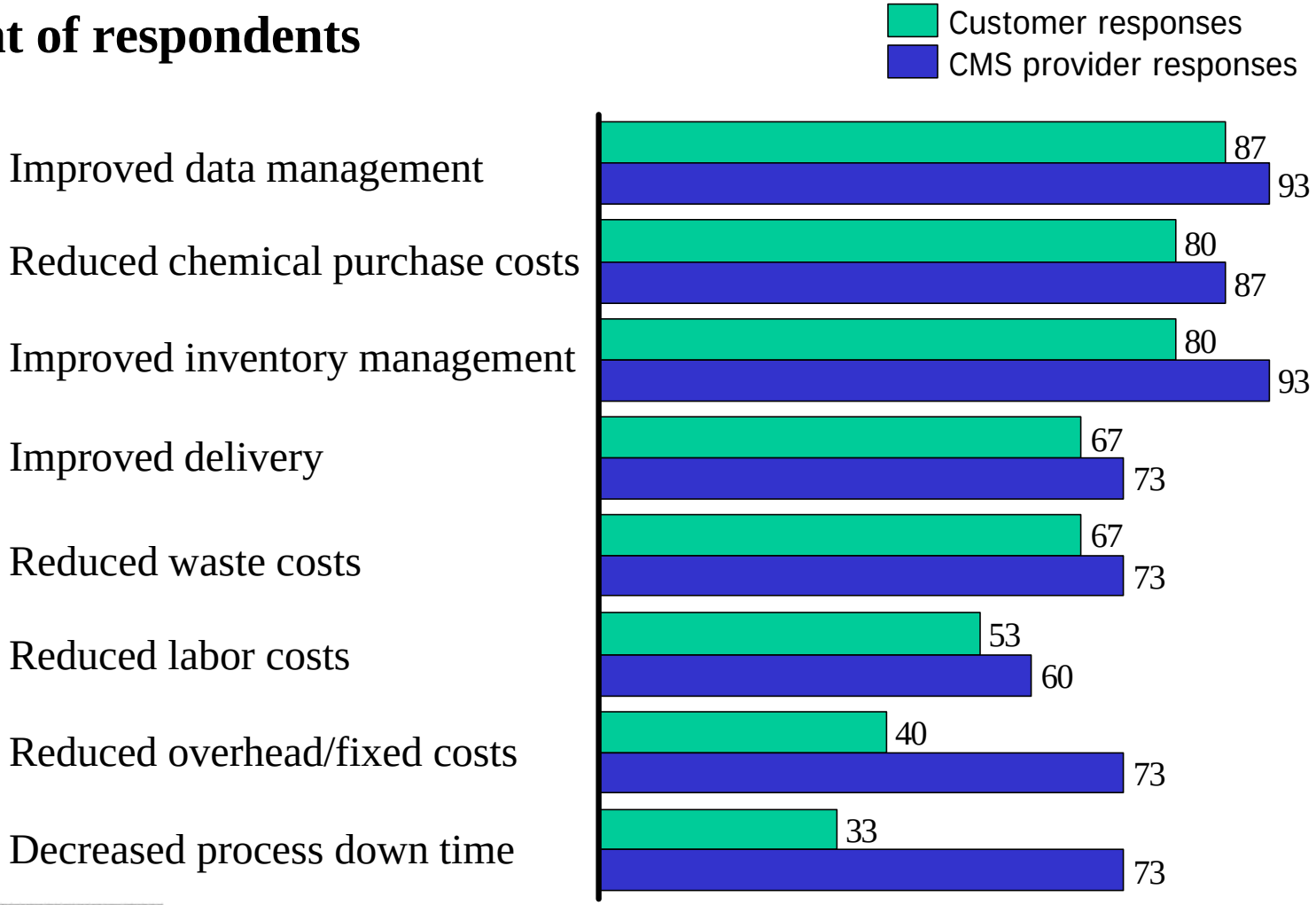
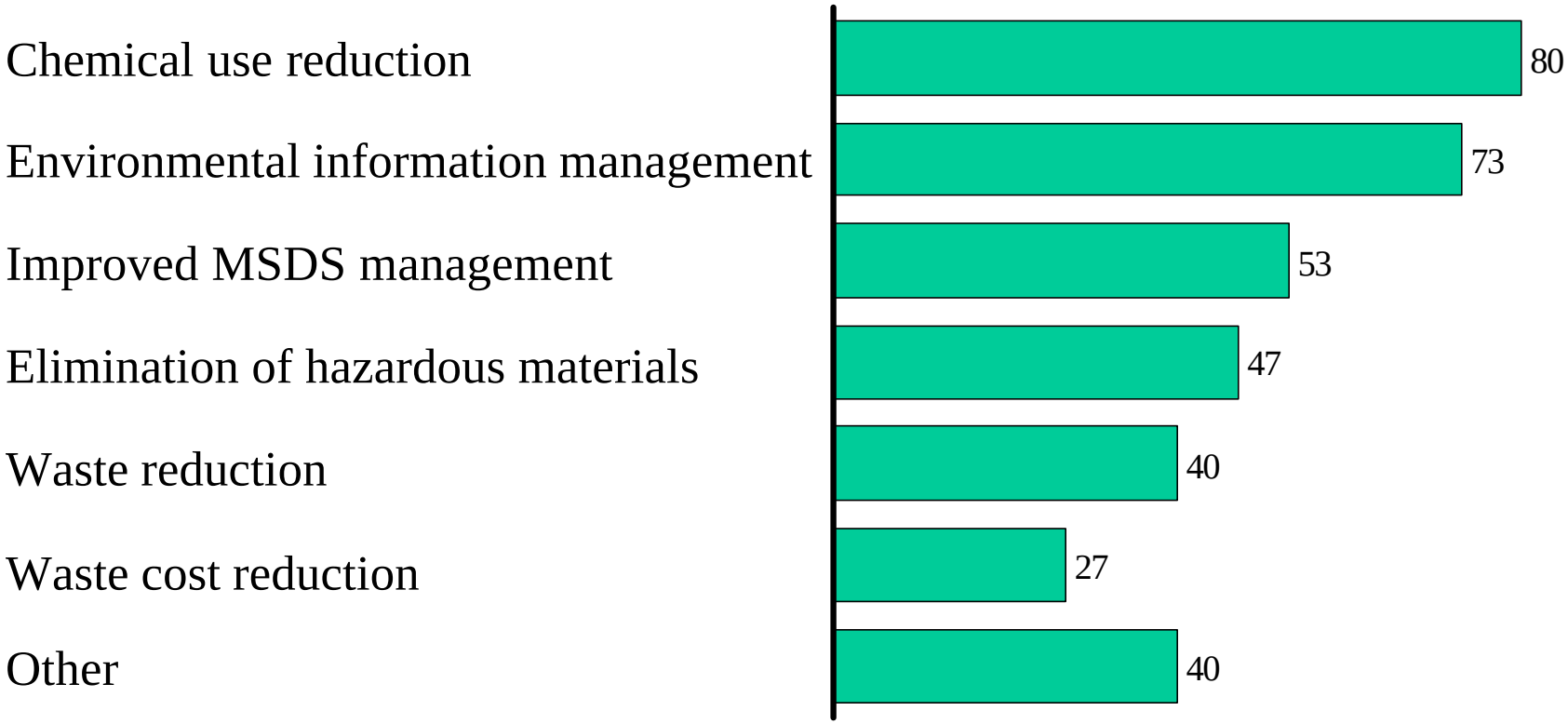
Improved data management is the benefit most widely cited by customers

Percent of respondents



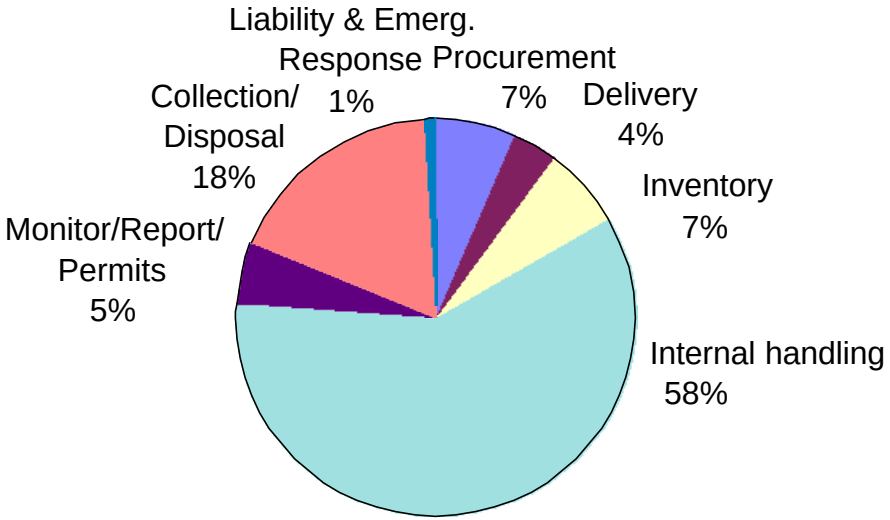
Environmental benefits are especially strong

Percent of customer respondents



Awareness of Chemical Costs is Key

- Experience with firms indicates:
  - "Buy In" to CMS rests on understanding of true chemical lifecycle costs via materials and cost accounting
    - Costs >$1 to manage every $1 purchased



- lifecycle cost information allows plants to decide if/how the CMS model can bring them value

Key Barriers & CSP Responses

Or...Why Aren't More Companies Doing It?

Barriers

- Chemicals are a small percentage of overall operating costs
- High perceived transaction costs
- Management support
- Supplier limitations
- Credible information

CSP Response

- Make true costs transparent

  CSP Manual: Tools for Optimizing Chemical Management
- Lower transaction costs
- Reduce institutional inertia
- Strengthen supplier base

  CMS Forum: membership group
- Disseminate credible information

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Estimated CMS penetration, Selected US Industrial Sectors

US Sector	1998 Chemical Purchases (USD millions)	CMS Penetration (percent)
Automotive	$4,944	50–80
Metalworking	$1,478	15–25
Aerospace Manufacturing	$252	5–15
Airline	$65	10–20
Electronics	$1,684	30–40

Source: CMS Industry Report 2000

CMS: Beyond traditional approaches

- CMS goes beyond traditional supply chain greening. . .
  - Redefines the nature of transaction, not just nature of product, to drive chemical use and risk reduction
- Also goes beyond most "strategic sourcing" initiatives
  - NOT focused on one-time reductions in unit purchase prices. Focused on continuous improvement based on knowledge and information systems, not just materials management

Reflections and futures

- While CMS is timely in many ways. . .
  - focus on core competencies, continuous improvement, suppliers as strategic resources; environment as business issue
- . . . It is a challenging business model
  - For users:
    - Chemical Management not a Priority; High Perceived Transaction Costs; Organizational Inertia; Supplier Limitations; Lack of Credible Information; poor data management and cost awareness.
  - For service providers:
    - If a chemical manufacturer, service unit profits are not aligned with increased production! Requires coordination across multiple business units of client firms

Reflections and futures

- But CMS *is* growing, like information-based enterprises in general
- Exemplary of where supply chain restructuring is headed in many business sectors
- Tellus is currently conducting similar research on waste contracts, called Resource Management

CSP Stakeholders

Primary Focus

- Chemical users
  - Pilot Companies
  - General Outreach
- Suppliers
  - CMS Forum

New Initiatives

- International
  - Europe, Asia
- Government
  - As chemical users & EPA
- Management Consultants
- Trade Associations
- Financial Community

CSP and Waste Minimization

- Model achieves waste reduction
  - More focus to waste management and processes
  - Reduces overbuying and “scrap rate”
  - Incentives so that CMS providers are rewarded for waste reduction
- Model functions to facilitate toxic use reduction
  - Improved lifecycle data drives change
  - CMS providers are gatekeeper (chemical clearance function)
  - Success in replacing chemicals
  - Increased chemical use efficiency for all chemicals

CMS as a model to achieve broader EPA initiatives

- ISO 14001/EMS
- Environmental Preferential Purchasing
- High Production Volume Challenge

Potential EPA role

- Help break open new sectors
- Influence development of the model to ensure environmental benefits are realized
  - Can influence customer and suppliers
  - New leverage point that can be influenced through upgrade of existing tools
  - Build supplier's environmental capacity
- Pilots and Workshops
- Encourage CMS through Incentives

Additional Slides

Chemical Management Services

- A strategic, long-term relationship in which a customer contracts with a service provider to supply and manage the customer's chemicals and related services
- Service provider provides focus to the management of chemicals allowing customer to focus on their core competency
- The provider's compensation is tied primarily to quantity and quality of services delivered, not chemical volume

Chemical Management Services

- Goes beyond invoicing and delivering product to optimizing processes, continuously reducing chemical lifecycle costs and risk, and reducing environmental impact
- Its not about outsourcing functions/labor but about adding dedicated external resources to chemical management
- These chemical services are often performed more effectively and at a lower cost than companies can do by themselves

CSP Approach

CSP conducts pilot programs to assist organizations in assessing their total chemical lifecycle costs and developing a CMS program.

I	II	III	IV
Planning	Baseline Chemical Costs	Develop Scope of Program	Engage a Chemical Services Provider
- Form team (Champion) - Select facility	- Map processes - Perform cost accounting	- Select chemical scope - Select lifecycle scope - Develop RFP language - Compensation options - Incentive options	- Distribute RFP - Select a service provider - Negotiate a contract

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Methodology Overview

Environmental Accounting

- **Understand material use**
- **Conduct cost accounting**
- **Establish baseline for environmental performance and total lifecycle costs**

Characterize Chemical Management System

- **Document chemical history**
- **Identify data management systems**
- **Determine chemical needs**
- **Document existing chemical supplier agreement**

Define Program and Contract Incentives for Environmental Improvements

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